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Cold collisions of complex atoms and molecules

Complex atoms such as the Lanthanide species Er or Dy exhibit a dense set of chaotic resonances. While the Feshbach spectrum of two Dy atoms versus magnetic field exhibits a clear signature of a chaotic spectrum determined by a random matrix Hamiltonian, it also exhibits patterned structure that is explained by the emergence of broad universal states in the midst of a sea of narrow chaotic resonances. This talk will explore theoretical aspects of the two- and three-body physics of cold Lanthanide atoms in such a domain of patterned complexity and examine some open questions that remain to be answered concerning the two- and three-body interactions of other cold atoms and molecules.

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